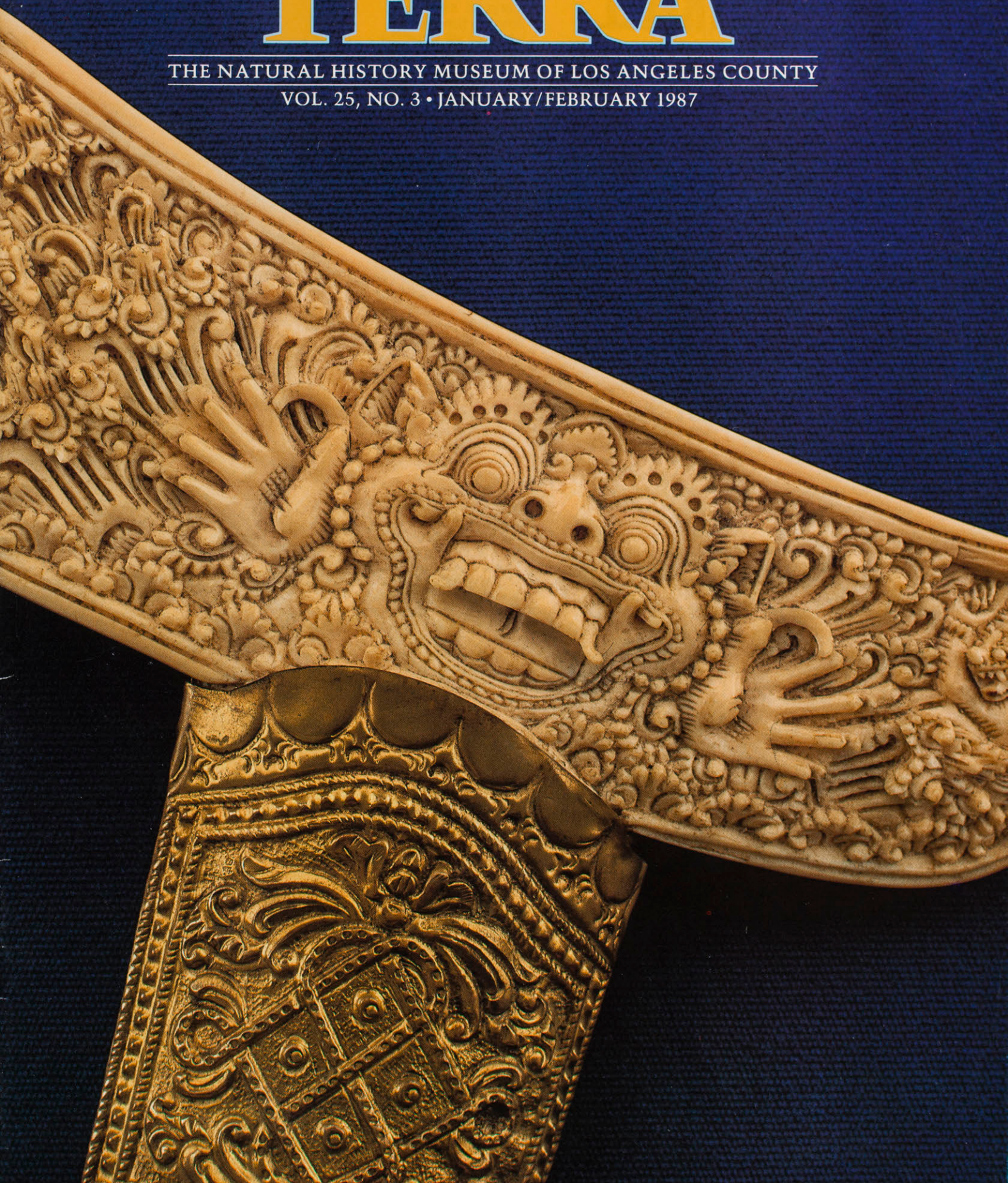


TERRA

THE NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

VOL. 25, NO. 3 • JANUARY/FEBRUARY 1987



Baja California and the Sea of Cortez, March 1-15, 1987

Join us on a cruise around the rugged peninsula of Baja California as we search for dolphins, elephant seals, sea lions, ospreys, and the biggest creature ever to inhabit the earth, the blue whale. Dr. John Heyning, our naturalist and marine mammal specialist, will help us to identify many other kinds of whales as well. From \$2,940, plus air fare.

Lapland Reindeer Safari, March 12-19

On this unusual winter adventure we will cross the Arctic Circle, enjoy lunch in a Lapp home, and relax in a Finnish sauna at the end of each exciting day. A visit to Helsinki, Finland's cosmopolitan seaside capital, will end our tour. \$1,999, including air fare.

New Zealand, April 10-25

This is a special exploration of the rich cultural and natural history of a lovely country. With our naturalist, Judy Chovan, we will see the beautiful mountains and fjords, rolling farmlands, quaint towns, and natural wonders of New Zealand. Tom Peirce of High Country Passage, our tour operator, will also introduce us to many New Zealand friends for a more personal touch. \$2,400, plus air fare.

Anasazi: Archaeology of the San Juan River, May 9-16

Join us as we float down the San Juan River, hiking in the beautiful side canyons and camping out under the stars. We will explore Anasazi cliff dwellings and see petroglyphs etched in sandstone, visit Paiute farms on Lake Powell, tour Navajo National Monument, hike to the famous Betatakin ruins, and spend one night at Gouldings Lodge in Monument Valley. Our experts, Dr. John Wright and Steve Glass, will be on hand to teach us about the archaeology, geology, and plant and animal life of the area. You can also learn and practice the primitive technology of the ancient inhabitants. (Second trip possible June 6-13.) \$630, including train fare.

Peru—Land of the Inca, May 12-26

This exciting expedition includes two full days at the Inca citadel of Machu Picchu

MEMBERS' TRAVEL PROGRAM

in the highlands. We will investigate the world-famous Nazca lines in the southern desert and visit the incredible adobe brick city of Chan Chan. Other highlights: the Inca fortress of Ollantaytambo in the magnificent Urubamba Valley, a boat trip to see the abundance of bird and marine life of the Balles-tas Islands, and a visit to the native highland market of Chinchero. Archaeologist Dr. Carol J. Mackey will accompany us. \$2,355, plus air fare.

Islands of Indonesia—Bali, Java & Sumatra, June 6-27

Indonesia holds an allure matched by few places on earth. Here we will visit the fascinating geographically isolated Batak tribes, an orangutan rehabilitation center, and many sites of breathtaking tropical beauty. We will explore the ancient temples of Java and the magical land of Bali. Our delightful Indonesian guide will treat us to private performances of music, dance, and art. \$2,285, plus air fare.

India & its Himalayas: Kashmir & Ladakh ("Little Tibet"), July 9-28

After visiting the Indian capital of Delhi and the Taj Mahal, we will stay in a former Maharaja's palace in the desert city of Jaipur. The remainder of the trip will focus on the cultures and beauty of the Indian Himalayas. With the famed houseboats of Srinagar as a base, we will explore the lovely Vale of Kashmir. Then one of the world's highest roads will take us over the Himalayas to the stark beauty of Ladakh and its Tibetan Buddhist culture. \$2,695, plus air fare.

Kenya Tented Safari, August 7-25

On our Kenya safari, we will search for elephant, giraffe, rhino, wildebeest, lion, cheetah, giant forest hog, and the rare bongo antelope,

not to mention a wide variety of birds and other animals. Parks visited include Amboseli National Park at the foot of Mt. Kilimanjaro; Aberdare National Park, where we will stay at the famous Ark; the Samburu Game Reserve; Lake Baringo; Lake Nakuru National Park; and the Masai Mara Game Reserve. An optional extension is available to see the mountain gorillas of Rwanda. \$2,750 plus air fare.

Paris to Peking Express, September 5-28

This extraordinary journey across the vast Eurasian continent to the Far East offers a rare chance to experience many cultures from the comfort of private rail cars. Expert lecturers accompany us on fascinating off-train adventures all along the way and lead informative discussions on board. Highlights include a private Chopin concert in Warsaw, a stay in a yurt camp on the Mongolian steppe, and the cultural riches of Paris, Moscow, and Peking. \$4,990, plus air fare.

Grand Canyon River Rafting, September 6-12

Our annual expedition through the Grand Canyon includes floating down the Colorado River, hiking in Surprise Canyon, camping on the river banks, exploring archaeological sites, and trying the primitive technology of the ancient inhabitants. \$560, including train fare. Please register early; space is limited!

Ancient & Living Greece, October 12-23. \$1,099, plus air fare.

Fall Foliage Cruise, October. Call 213/744-3426 if interested.

Steamboat in the Mississippi, November 16-22. From \$1,189.

Yucatan—Land of the Maya, December. Call 213/744-3426 if interested.

For further information, please send a self-addressed stamped envelope with your request to the Membership Office, Natural History Museum, 900 Exposition Boulevard, Los Angeles, CA 90007, or call the Membership Office at 213/744-3426.

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TERRA

THE MEMBERS' MAGAZINE
OF THE NATURAL HISTORY MUSEUM
OF LOS ANGELES COUNTY
AND THE PAGE MUSEUM
OF LA BREA DISCOVERIES

VOL. 25, NO. 3 • JANUARY/FEBRUARY 1987



COVER: Detail of the ivory handle of a Balinese *kris*, a blade favored throughout Islamic-influenced south-east Asia. This sword and other Asian arms and armor will be on display at the Natural History Museum through summer 1987. Photograph by John De Leon.

EDITOR

Robin A. Simpson

ASSOCIATE EDITORS

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DESIGN

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Heide Thorstenson/Francis Strazzulla

50 West Hillcrest Drive, Suite 215

Thousand Oaks, CA 91360

Telephone: 805/496-3500

Telex: 182640 WKVG

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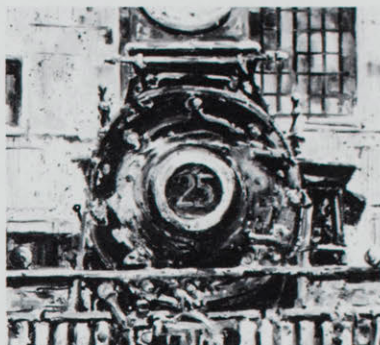
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Kathleen L. Rydar

Kathleen L. Rydar Joins Museum.

Kathleen L. Rydar has joined the Natural History Museum as Associate Director and Vice President for Development. In this position she will be responsible for the Natural History Museum Foundation's Development, Membership, and Public Relations departments and will furnish staff leadership for the museum's \$30 million Seventy-Fifth Anniversary Campaign.

Prior to beginning work at the museum, Ms. Rydar was Director of Development at the San Francisco Museum of Modern Art, where she was responsible for fund raising and membership, which provided 70 percent of the museum's \$5.5 million annual budget. Ms. Rydar has also served as Director of Development for the Schools of Fine Art and Architecture at the University of Southern California. In addition, she has had extensive development and public relations experience at Purdue University and Hiram College.

Ms. Rydar has a Bachelor of Arts degree in English literature and speech communications and a Master of Arts degree in English literature, both from Kent State University, Ohio.

Ms. Rydar's extracurricular activities include membership on Los Angeles and San Francisco YWCA Boards of Directors, and active participation in the Council for the Advancement and Support of Education. She has written extensively in the fields of fund raising and special events. The museum is indeed fortunate to welcome a person of Ms. Rydar's great talent and experience to its staff.

Foundation Board of Trustees Welcomes Two New Members.

Dr. Ray R. Irani, President and Chief Operating Officer of Occidental Petroleum Corporation, and former California Attorney General Evelle J. Younger, Esquire, a partner in the Los Angeles law firm of Buchalter, Nemer, Fields, Chrystie & Younger, were elected to the Natural History Museum Foundation Board of Trustees at its September meeting.

Dr. Irani has been president and chief operating officer of Occidental Petroleum Corporation since September 1984 and a director of the company since July 1984. Until his appointment as Occidental's president, he also served as an executive vice president of the firm. He joined the Occidental organization in June 1983 as chairman and chief executive officer of Occidental Chemical Corporation, an Occidental Petroleum subsidiary. Prior to joining Occidental, Dr. Irani served as president and chief

operating officer of Olin Corporation and as a member of that firm's board of directors.

Dr. Irani was born in Beirut, Lebanon, and received a B.S. degree in chemistry from the American University there and a Ph.D. in physical chemistry from the University of Southern California. He is a director of the Chemical Manufacturers Association and the American Petroleum Institute, and is a member of the American Institute of Chemists, Inc.; the American Chemical Society; the Scientific Research Society of America; and the Industrial Research Institute. Dr. Irani is also a director of the Los Angeles Area Chamber of Commerce and a member of the board of trustees of St. John's Hospital and Health Center Foundation.

Evelle J. Younger, elected California's attorney general in November 1970, was California's first Republican attorney general since 1947. He was re-elected in November 1974 with the highest total vote received by any Republican candidate in the United States that year. As the 1978 Republican nominee for governor of California, he was defeated by incumbent Governor Brown and returned to private practice.

Mr. Younger is a native of Nebraska; he earned his A.B. and LL.B. degrees from the University of Nebraska and has done graduate work in criminology at Northwestern University Law School. A former Deputy Los Angeles City Attorney, Pasadena City Prosecutor, Instructor in Criminal Law at Southwestern University Law School, and Judge of both the Los Angeles Municipal and Superior Courts, he was elected District Attorney of Los Angeles County in 1964 and again in 1968.

He presently serves as Vice President, Los Angeles Area Council, Boy Scouts of America; Director, California Council for Environmental and Economic Balance; Director, U.S.-Mexico Chamber of Commerce; Director, Americans for Effective Law Enforcement, Inc.; Advisory Council, National Strategy Information Center, Inc.; Board of Trustees, City of Hope; and Advisory Council, Commission of the Californians.

Alliance Board Elects New Members.

The Alliance Board of Directors, chaired by Mrs. Betty Reddin, elected six new members at its September meeting, bringing the total membership to 41 community leaders organized within ten committees. Elected for initial one-year terms were Mary Jane Ahmanson Bettfreund, owner of Time to Travel in Canoga Park; Dr. Patricia House, psy-

(Continued on page 27)

IMAGES OF A GOLDEN ERA

Paintings of Historic California by Ben Abril

Coming into Town. Located in the California desert, twenty miles south of the China Lake Naval Weapons Center, is the abandoned ghost town of Randsburg. Its name and that of the neighboring town of Johannesburg were adopted from the Rand mining district of South Africa. The main street of the town, which was quickly formed in 1895 after the discovery of gold by three miners, leads to the Yellow Aster Mine. After two years of working their claim with little luck, they were ready to give up. However, when they were down to their last pound of bacon rind and coffee, they made one last search for gold. Slicing into a prominent rock, one of them struck pay dirt, and the site became the glory hole of the Yellow Aster Mine, producing over \$200 million before it closed. Today, Randsburg is nearly a ghost town with a dwindling population of about 85 retirees, including some of the old-time prospectors. The wild exuberance of this former boom town has disappeared, but the skeleton of the Yellow Aster Mine still dominates the desert landscape.



Chinese Camp. The old gold town of Chinese Camp is located on the Mark Twain-Bret Harte Trail along Highway 49, in California's mother lode gold country. Chinese Camp was founded about 1849 by a group of Englishmen who employed Chinese miners to find surface gold on the hills and flats. The town was also headquarters for stage lines early in 1850 and for several Chinese mining companies. The first Chinese tong war in California was fought here between the Sam Yap and Yan Woo tongs. High on a hill, surrounded by an abandoned graveyard, a little white Catholic church overlooks Chinese Camp. The church, named Saint Francis Xavier, was built in 1855. An inscription on the large tombstone in front of the church reads: "Sacred to the memory of Sarah Goodwin. Born February 11, 1828—Died November 11, 1898. Native of County Tyrone, Ireland. May she rest in peace."

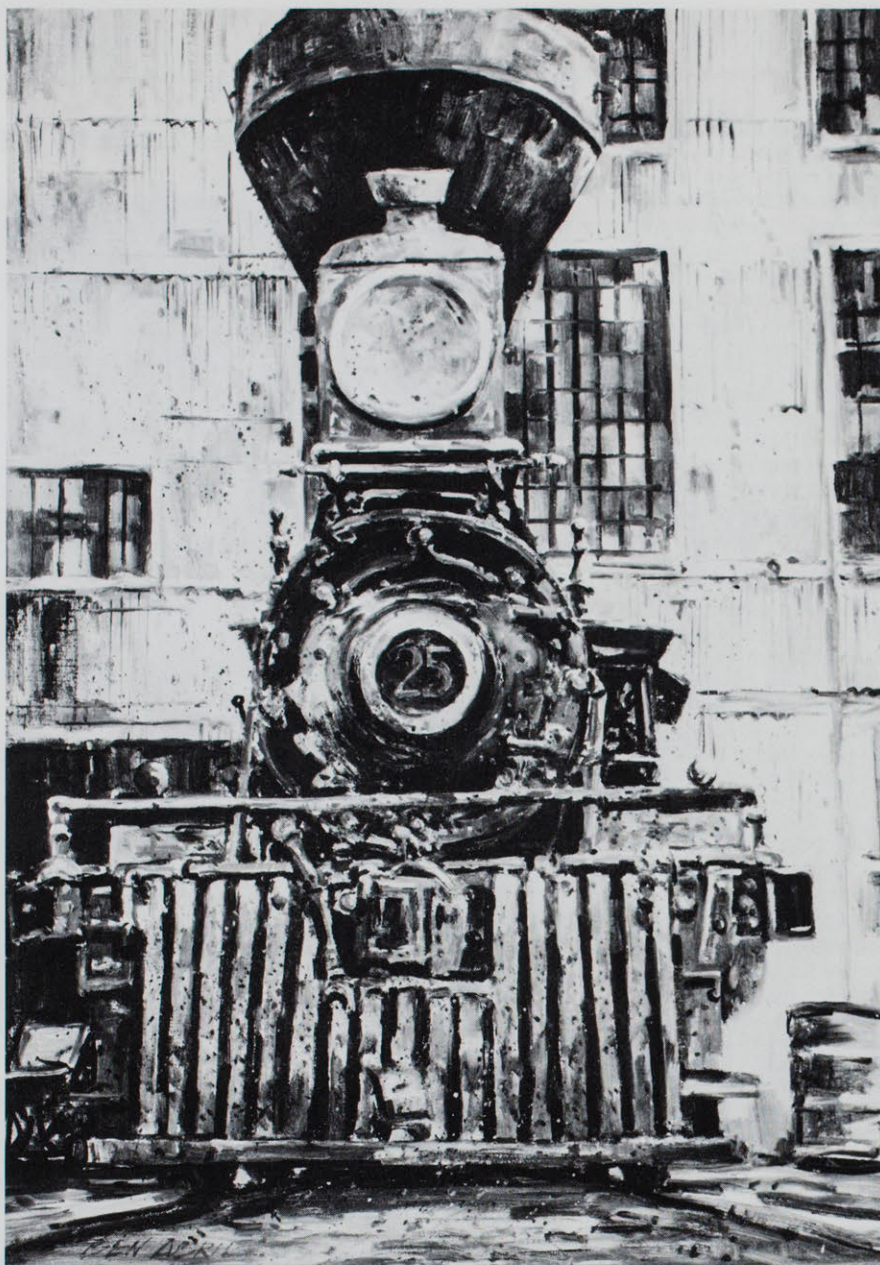


It could be something as prosaic as a pig ranch. Or an old cabin. Yet that pig ranch and that old cabin are replete with history. Perhaps the pig ranch, owned by Armenian immigrants to California, helped fuel America's war effort during the Second World War; the old barn was the setting of numerous Westerns starring such luminaries as Gene Autry, Hopalong Cassidy, Roy Rogers, and the Lone Ranger. Not every old schoolhouse was once the background for a silent movie nor did Padre Serra found every mission in California, but any edifice, any landscape has a story to tell, however mundane, however prosaic. And there is a beauty in those landscapes and weathering structures, if we only stop and look.

Says Ben Abril, who has painted these picturesque and historic scenes, "the beauty of California is my inspiration." The old post offices, the general stores, the old roads that go nowhere, imbued with California's gorgeous natural light, are the setting for the Los Angeles native's paintings done *alla prima*—completed on the site in one working session. Fifty-two of these paintings of California's golden era go on display in the Natural History Museum's Rotunda February 23 and continue through April 26, 1987.

Mr. Abril is no stranger to the Natural History Museum, for in early 1969 the museum displayed 36 of his scenes of the old Victorian mansions of Bunker Hill, painted not too long before the area became one in a series of high rise developments. The museum later purchased all 36 paintings for its permanent collection. And while supporting himself during his early career as an artist, Mr. Abril spent twenty years working for Los Angeles County, first as a cartographer and later as a color consultant on architectural design. He has also painted on commission to the U.S. Navy, and the Los Angeles Olympics Organizing Committee requested him to do a painting of the Coliseum, which was used on an opening ceremonies luncheon invitation addressed to the heads of state of the 140 countries competing in the XXIII Olympic Games.

Leon G. Arnold, Assistant Director of the Natural History Museum and a friend of the artist, has said: "Ben Abril is a romantic painter with the ability to portray great feeling in his art, and he creates a mood of ease and wonderment for the viewer. Abril's paintings are not contrived and have a refreshing directness in harmony with nature....He has always strived to create work true to his own ideals rather than be influenced by the current trends....The paintings shown here will preserve our American heritage long after the scenes are gone."



Baldwin Ten Wheeler. This 45-ton giant was built in 1905 by the Baldwin Locomotive Works for the Virginia and Truckee Railroad and saw forty years of service. In 1945 the cap-stacked Baldwin was fitted with a false diamond stack and an oversized headlight to serve as a special Nevada Admission Day train. In 1947 the locomotive was sold to RKO Pictures and eventually appeared in ten films. In January 1955 she was featured on a special fiftieth-anniversary excursion by the Railway and Locomotive Historical Society between Los Angeles and San Pedro, lettered as San Pedro, Los Angeles and Salt Lake, Union Pacific number

25—the train's last public steaming. She was stored for many years in Union Pacific's East Los Angeles yard before ending up in her final resting place in the historical collection at the Nevada State Museum in Carson City.

THE ART OF THE ASIAN ARMORER

by DONALD CHAPUT

Photographs by JOHN DE LEON

It is impossible to represent the arms and armor of a continent as vast as Asia in an exhibit of eighty weapons. Nonetheless, a study of the Natural History Museum's unusually rich collection of Asian edged weapons and firearms, and their manufacture and use, can provide a worthwhile excursion into Asian history.

For the purposes of the exhibit, the Art of the Asian Armorer (which appears in the gallery opposite the Seaver Center on the ground floor, January 31 through summer 1987), our definition of Asia includes that huge expanse of land from Turkey's Anatolian Plateau to Japan, from the top of Siberia down to Sri Lanka and east to Indonesia. Artisans and armorers in these lands developed technologies and designs that were distinct from the processes and products of Europe that are more familiar to us. In addition, archaeological evidence that has become available in the past half century leads us to believe that the eastern Mediterranean was not the essential starting point of the use of iron, copper, and other metals, as we had once believed. Excavations in northwestern India and at Ban Chiang, Thailand, have established that many Asian cultures had early use of metals and that knives and swords of metal were used in Asia much earlier than in Europe and parts of the Near East.

Our knowledge of early Asian metallurgical techniques is limited, although we can learn much from the study of the metallic content of certain pieces. Styles of artisanship may have been similar in various places; the earliest artistic renditions of metal working from Siberia,

China, Japan, and India show typical scenes: men near fires beating on metal with hammers and other tools while air is blasted at the fire to increase the heat. The type of iron, kinds of fuel, temperature in smelting, and other local quirks could change the appearance of the final product. Where military activity was important, much time, material, and effort were expended on weapons. The best metals, the finest craftsmen were called into play. Some of the pieces on exhibit were purely functional, while others were created for ceremonial use. The craftsmen's knowledge of such arts as enamel work and *koftegari* (etched gold and silver inlay) were often retained in the same families for generations.

Most of the weapons in the exhibit are from what is now modern India and Pakistan. The phrase "Indo-Persian" is often used to describe this region and its particular styles of design and workmanship. This region has a long metallurgical tradition, and use of iron and perhaps steel began here. Persia, the gateway to India for so many invasions, came to dominate in the shape, design, and type of many of the weapons. Said H. Russell Robinson in *Oriental Armor* (1967, page 17): "The Persians were the armorers of Asia, for they surpassed all others in this important craft." Apprentices trained in the Persian centers at Esfahan and Khorassan were often subsequently employed in Russia, Syria, India, and Egypt. Many of the Indian rajahs had Persian armorers, and Persian weapons were commonplace among the Indian aristocracy. This Persian influence was associated with the religion of Islam and was

carried into India by the Persians, Afghans, Turks, and other invaders from the north and west.

Because of India's size and wide religious, ethnic, and linguistic diversity, there was no typically Indian weapon. Some weapons, such as the *katar* (a thrusting knife) and *talwar* (a sword) were found throughout the subcontinent, but differing slightly in size and design. Other weapons became associated with particular regions: the *kora* (a sword with a wide, broad end) was found only in Nepal, as was the *kukri* (a curved knife). The *pata* (a gauntlet-knife) originated with the Rajputs in northwest India.

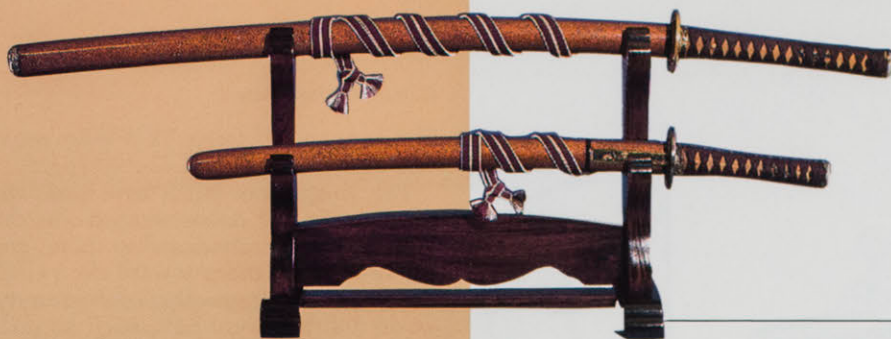
Other regional differences were the geometric and floral patterns so common in Kashmir and in the Punjab, while gold work in shields was found frequently in Delhi and Lahore. Leather was used in many regions, but in different ways, according to custom and availability. In Persia, scabbards were often of shagreen (from the hide of a donkey's back), which was usually dyed green and toughened. In India, leather shields were made of rhinoceros, elephant, or deer hide, depending on what was available.

The typical weapon of the southern Philippines, Indonesia, and Malaysia—indeed, for all the Islamic people of southeast Asia—was the *kris*, an edged weapon with either straight or wavy blades. There are varying traditions to account for the shape of the hilt and the number of curves in the blades. Men often carried two in a waist sash. Many significant rituals surround the *kris*, and they are considered to be talismans; for example, in Malaysia, the pointing of a

(Continued on page 10)

An interesting example of design and shape retention is seen in a Turkish yatagan (center), a nineteenth-century saber with an incurved blade. This is almost identical to a Luristan bronze blade (right) manufactured in the same region three thousand years before. It in turn derives its shape from the earlier Greek and Egyptian kopis blade of 4,000 B.C. Shown with the yatagan is its elaborate scabbard.





In no other country was the sword such an integral part of society as in Japan. For over a thousand years, generations of artisans lavished their greatest skills on producing the finest blades and fittings, as seen in these early nineteenth-century pieces. Pictured here is a daisho arrangement; the longer sword is called a katana and the shorter a wakazashi.



This Japanese picture scroll dates from the 1840s and contains several dozen illustrations of the steps involved in putting on a suit of Japanese armor.



An early Japanese weapons forge scene.



This ornate kris with carved ivory handle and hilt of gold is from Bali and was most likely owned by a member of the aristocracy. The watered blade is a fine example of damascene work.



(Continued from page 7)

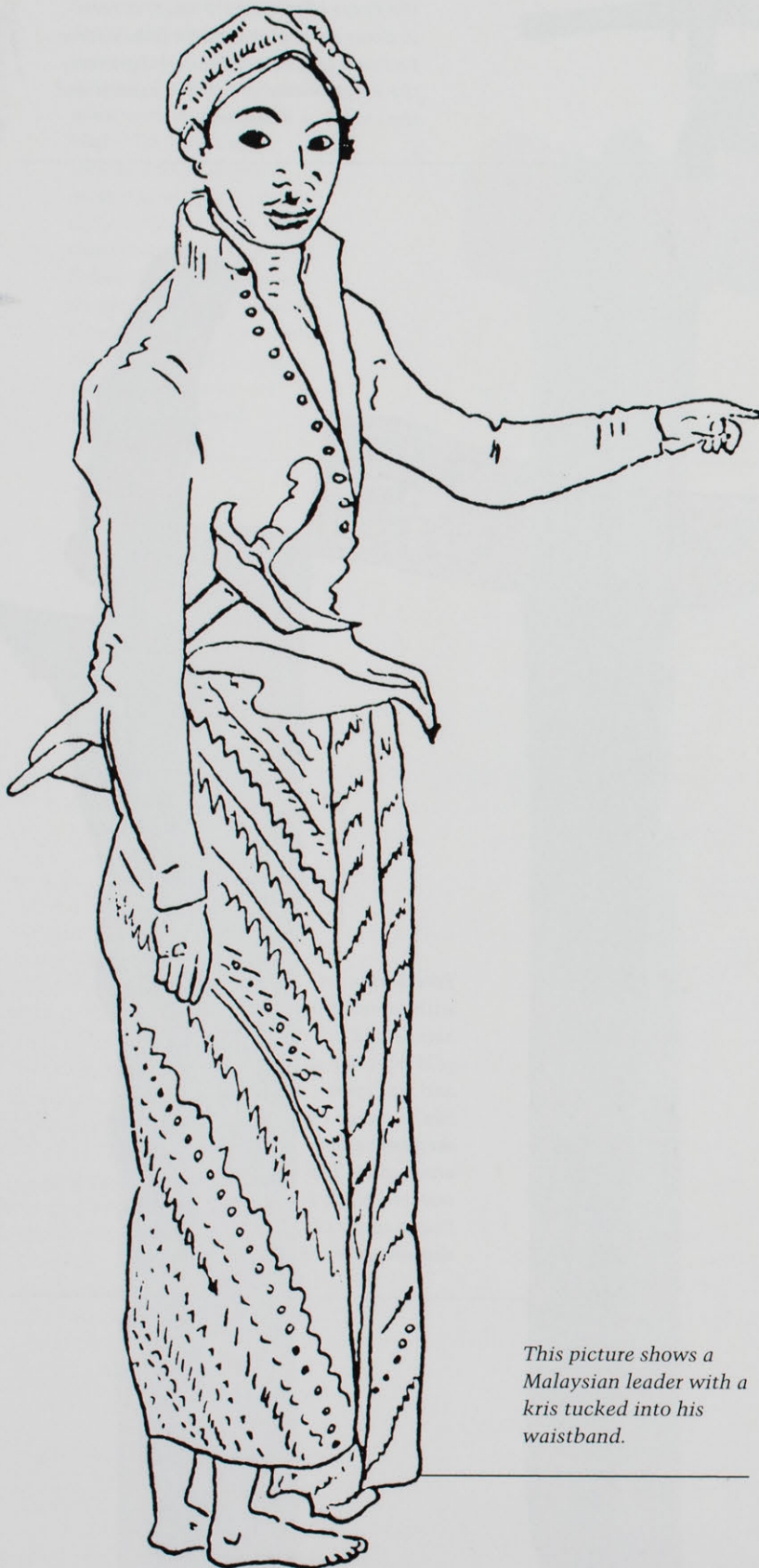
kris into the footsteps of a man could lead to his death.

The weapons of Japan have been the most studied of Asian weapons, as the quality of the craftsmanship there, and the intense attitudes toward the sword, had no parallel. In no other country in the world did the sword have such an integral part of society as in Japan. For over a thousand years, generations of artisans have lavished their skills on producing the finest blades and fittings. The warrior carried the sword not only as a weapon, but as a symbol of the samurai spirit (*bushido*) in peace and in battle, even through World War II. The sword was the soul of the samurai, his most precious possession, and often passed from one generation to the next. Firearms came early to Japan, yet they never attained the significance there that they did in the rest of the world because of Japanese attitudes to man-to-man combat and respect for the sword.

In 1872 the *Illustrated London News* published several views of the Asian arms collection of the Duke of Edinburgh. The quality and number of his pieces may have been unusual, but the fact that a Britisher had such a collection was not. By the late nineteenth century, tens of thousands of British officers and soldiers had served in India, many of them of multi-generation military families. England to this day is the center of enormous rich collections of Asian arms and armor, especially those of the Tower of London and in the Wallace Collection, also in London.

The collections of arms and armor in the Natural History Museum of Los Angeles County represent most Asian regions. In addition to important holdings of artifacts from the Indo-Persian realm, the collections are especially extensive and varied in Philippine and Chinese weapons, a result of U.S. interest in the Philippines and China at the turn of the century. These riches enable us to view the unusual heritage of the peoples of Asia in designing, manufacturing, and modifying these pieces over thousands of years.

Donald Chaput is a curator in the Natural History Museum's History Division with responsibility for the arms collections. The preparation of material for exhibit was by master restorer-collector Bruce Bates, whose specialty is the arms of India and Persia, and John Plimpton, an advanced collector of Japanese edged weapons.

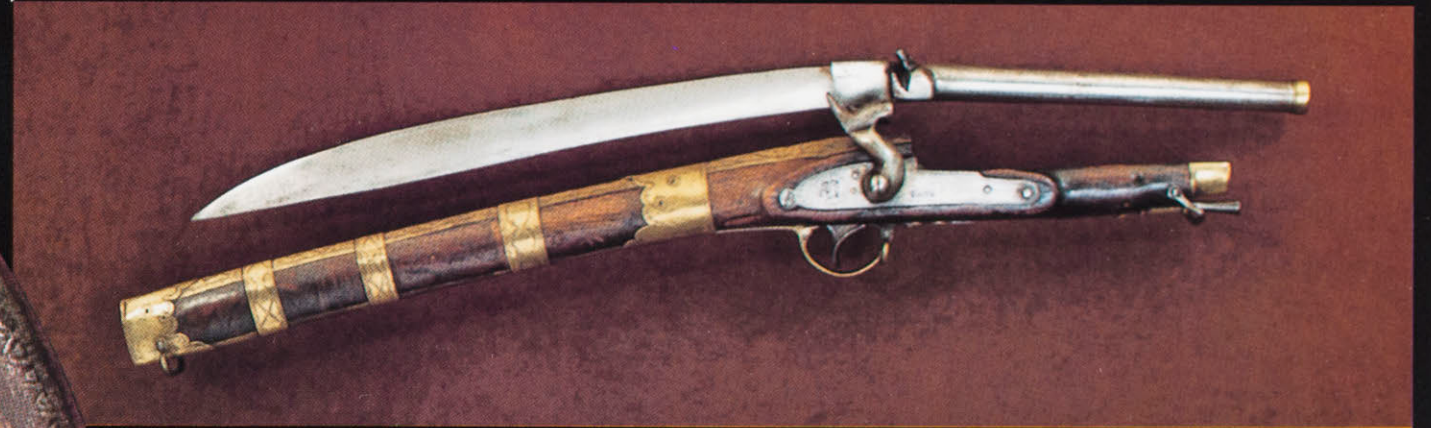


This picture shows a Malaysian leader with a kris tucked into his waistband.



An early twentieth-century view of an Indian damascene worker, with the inset showing an example of his work. The word "damascene" has been the subject of much confusion in steel nomenclature. The system seems to have originated in India and was perfected by Persian armorers. After the rise of Islam, Damascus, Syria, became the important center of this steel process. The word "damascening" refers to the watered or striated structure in certain blades.

Page 13, top, and center: This unusual combination knife-pistol was probably made in Germany for the Far East market in the late 1800s.



Detail of shield.



The shape of this eighteenth-century leather Persian shield is typical, but the elaborately painted hunting scene suggests that it was not made for regular use.





This Mogul officer from northwest India is carrying three traditional weapons: a shield, a sword, and a katar, (the thrusting knife in his sash).



T. E. Lawrence of desert fame, wearing a jambiya, a knife found throughout Arabic portions of the Near East.

This scene shows a visit of the Prince of Wales to India in 1876. The men in front are brandishing patas, long-bladed weapons that have protective hand coverings. These thrusting weapons were common in northern India.



FRIDAY,
SEPTEMBER 12,
1986

As the container ship *Barber Tampa* cruised down the Santa Barbara Channel toward the Los Angeles Harbor at 25 knots (29 miles per hour), she suddenly and inexplicably slowed to 23 knots; the crew also noted a concurrent increase in fuel consumption. The captain ordered a check of the engines, but nothing seemed to be amiss. As the *Barber Tampa* docked in Los Angeles Harbor, the cause of the problem became evident when a large blue whale (*Balaenoptera musculus*) floated free from the ship's bow. The blue whale had been struck and immediately killed by the ship and then was trapped by water pressure against the *Barber Tampa's* bulbous bow.

The National Marine Fisheries Service (NMFS), the federal agency charged with the protection and management of marine mammals, was the first agency contacted after the whale was discovered. The NMFS in turn notified the Natural History Museum's Marine Mammal Stranding Program of the dead whale because the museum is the local scientific institution that studies and collects marine mammal specimens.

The blue whale is an endangered species (only 1,200 blue whales live in the North Pacific and there are only 10,000 worldwide), and there are few specimens in museum collections. Because of the animal's enormous size we decided to obtain only the whale's skull for the Natural History Museum's collection. The skull provides a great deal of information about the whale and is the most valuable part of the skeleton to scientists.

The City of Los Angeles Harbor Department immediately made arrangements to tow the whale to the side of the main channel, out of the shipping lanes, and tie it up so that we could examine it. It was now early evening, and we were able to determine only that the whale was 74 feet (22.5m) long and female. Blue whales from the Antarctic have been known to attain a length of 100 feet and weigh up to 150 tons, which makes them the largest animal ever known to have inhabited the earth—larger by far than any dinosaur.

We negotiated with the Harbor Department to obtain permission to have the whale towed during high tide to Cabrillo Beach where we could work on it. Timing was a critical factor in all our logistical considerations as it was often important to take advantage of either a high or low tide, depending on the task. In this instance we needed a high tide so

that the water would help buoy the whale as close as possible to the shore. We made calls throughout the evening to mobilize a network of volunteers from the Cabrillo Marine Museum and the American Cetacean Society to assist us in the dissection and collection of the specimen. The volunteers included researchers, students, teachers, housewives, firemen, and passersby, who, over the next few days, very generously gave us of their time and energies.

SATURDAY

By 6 a.m. we were photographing and measuring the whale as it lay tied to a berth in the harbor. Overnight the whale's appearance had changed dramatically, and it would continue to change over the next five days. Its skin had begun to fade from a glossy blue gray to a lifeless dark slate gray, and its body, once sleek and streamlined, became swollen as it became distended with gases formed by decomposition of its tissues.

A volunteer diver entered the water and attached a rope to the whale's tail to allow a tug to tow it to Cabrillo Beach. As the tug pulled the whale toward shore, it was halted by a sandbar about 100 yards out from the beach. The whale lay aground

in approximately eight feet of water. After a few futile attempts at moving the whale closer to shore, the tug left. It was now up to us to bring the whale in the rest of the way.

The four-ton winch on a museum truck did little to budge the dead cetacean, which we estimated weighed at least ninety tons, and it was now stuck fast in the sand. Jay Peacock, of Peacock Boat Building, offered the services of his eighteen-ton crane. At the next high tide, we made several attempts to move the whale, during which many ropes and steel cables were broken, until we finally pulled the whale close enough to the beach so that the head was resting in shallow water.

Meanwhile, our whale had become a major media event. Local and national television news crews and newspapers covered our efforts. The blue whale was on television in Japan, Italy, Belgium, and a host of other nations. Crowds, numbering 100 to 200 people, followed our efforts throughout the weekend. However, as the weather grew hotter and the whale began to decompose, the pungent smell of decaying whale took its toll on our gallery of onlookers.

Whales are covered by a thick layer of blubber; this, combined with their large size and warm-blooded nature, begins

WANTED DEAD OR ALIVE

The
Natural
History
Museum's
Marine
Mammal
Stranding
Program

by JOHN E. HEYNING and
JUDITH L. CHOVAN





Dr. John Heyning, coordinator of the Natural History Museum's Marine Mammal Stranding Program, and Dave Janiger, volunteer, begin to sever the head from the whale's body. While the whale was being towed to Cabrillo Beach, the body lodged on a sand bar and could not be moved any closer to shore. Because of the animal's enormous size, only the skull was obtained for the museum's collections.

Page 16: On September 12, 1986, a 70-foot female blue whale was killed when it collided with the container ship *Barber Tampa*. The next day the whale was towed from where it had been moored overnight in the Los Angeles Harbor to Cabrillo Beach. Note the whale's steel blue coloration and slight bloating. The whale is floating on its back and its rorqual (throat) grooves are visible. These grooves allow the throat to expand in size (in a manner similar to that of the Brown Pelican) to take in large quantities of water for filtering out krill, the blue whale's tiny prey.

Once the whale was in shallow water, many people assisted in cutting chunks of tissue off the head to lighten it. Here the whale is upside down; the roof of the mouth is visible. The baleen is in place on the left side, but has already been removed from the right. The lower jaw bones have also been removed. The intestines are filled with gas and are extruding.



literally to cook the animal from inside upon death. Whales decompose rapidly and the fragrance ranks among the worst and most lingering of all smells. Its oily nature penetrates skin, plastic, wood, and clothing with ease. There are several sets of clothes, wet suits, and interiors of vehicles used in this whale-stranding operation that will never again be the same.

SUNDAY AND MONDAY

When we got to Cabrillo Beach Sunday morning, the gases generated by the whale's decomposition had caused it to roll on its back, and its ventral surface was grossly swollen. We took more measurements and waited for a low tide before attempting to sever the head from the body.

The head of a whale is up to one-fourth of the length of the animal's body and in this case weighed 10 tons and was 12 feet in diameter. All the work severing the head was done by hand using long blades and knives from Norway and Japan designed for flensing whales by the whaling industry. This long and arduous task was completed principally by one of the authors, a member of the museum's mammalogy staff, and a volunteer while standing on top of the whale or waist deep in cold water.

While we were wrestling with the whale's head in the water, volunteers on shore hauled on ropes to provide tension to make the cutting easier and to help separate the head from the body. This could not be done at high tide, because when the tide came in, the body of the whale would actually float, and it was not possible to pull or put tension on the skull without the whole animal moving. Volunteers also helped bring in chunks of blubber that had been cut away from the whale; these chunks weighed up to several hundred pounds each. The museum's staff worked to remove the two lower jaw bones and baleen to further reduce the weight of the head. Jay Peacock brought his crane down once again, but was unable to remove the skull by Monday evening.

TUESDAY AND BEYOND

For aesthetic and safety considerations, the Harbor Department wanted to remove the whale from the beach as soon as possible. They had arranged to have a tug tow the whale out to sea during the high tide Tuesday morning, but at dawn the head was still stubbornly attached to the rest of the body. Fortunately, however, we were granted a reprieve until the

high tide that evening. Everyone worked madly to remove the head, and by afternoon only a narrow strip of tissue still remained.

Early Tuesday evening, a fleet of tow-trucks from the Seventh Street Garage in San Pedro lined up for what has to be one of the most unusual heavy equipment pulls ever—a spectacle fit for the Coliseum—in a final attempt to sever the whale's head from its body. The trucks' combined efforts pulled the skull

free and onto the shore. A tug then towed the rest of the body twelve miles out to sea for sharks and other marine scavengers to clean up.

We spent Wednesday removing as much of the tissue as possible from the skull so that it would be light enough to lift from the beach onto a museum truck for transport to our research facility. On Wednesday afternoon Jay Peacock again brought his crane to the rescue and lifted the nineteen-foot, three-ton skull and



This fin whale stranded alive in Long Beach in 1897. It measured 63 feet 7 inches long. The complete skeleton was on public display in Long Beach for many years, and in 1975 it was donated into the Natural History Museum where it is now part of our research collection. Mammalogy Collection.

the two lower jaw bones off the beach and onto a museum truck. The whale's skull slowly made its way up city streets to its final resting place at the museum's Large Mammal Warehouse in East Los Angeles. The twenty-five-mile trip took two hours.

On Thursday a skip loader from the Los Angeles City Department of Parks and Recreation loaded the pieces of blubber and other scraps onto a museum truck to take to a dump. The final day at

the beach was spent cleaning up the beach and the museum vehicles.

Whales, dolphins, and porpoises belong to an order of fully aquatic mammals collectively called the Cetacea. Cetaceans are classified into two groups: the baleen whales and the toothed whales. The baleen whales do not have teeth, but instead have baleen, a series of fringed, flexible plates that grow down

from the upper jaw. Baleen is made of keratin, the same substance that hair and fingernails are made of. These plates form a hairlike mat with which whales filter small fish and crustaceans out of the water in vast quantities. The ten species of baleen whales include the gray whale (*Eschrichtius robustus*), which is commonly seen migrating off our coast in the winter and spring, and the blue whale.

As the name implies, the toothed



whales have teeth; they feed primarily on fish and squid. There are more than sixty species of toothed whales including the sperm whales, beaked whales, dolphins, and porpoises. The terms "whale" and "dolphin" are popularly used to refer to large and small cetaceans respectively and are not biological designations. For example, the killer and pilot "whales" are actually large members of the dolphin family.

Cetaceans pass their entire lives in water, spending more than 95 percent of their time submerged, usually coming to the surface only to breathe. Their aquatic lifestyle makes cetaceans as a group difficult to study in their natural

environment, and the large size and rarity of many species make it impossible to study them in captivity. So little is known about cetaceans that scientists are still not sure how many species there are. Since 1950, five species new to science have been described, a number unheard of for other groups of large mammals. This is why the information that biologists glean from the study of the whale's skeleton is so important.

Many types of information are collected from dead cetaceans, especially if they are not long dead and the tissues are fresh. Each animal can provide biologists with important data on the natural history of the species. For example, the

distribution of many species is known only from where strandings have occurred. Since it is difficult to observe cetaceans at sea, photographs and measurements of stranded animals provide biologists with details as to the size and shape of a particular species and its true color pattern, which are often difficult to discern in water. Until this decade, most illustrations poorly portrayed the natural pigmentation and true shape of most cetaceans.

Examination of the contents of the animals' stomachs supplies biologists with data on the types and amount of prey consumed. Amazingly little is known of the food typically eaten



Jay Peacock of Peacock Boat Building using his crane to lift the skull (minus the lower jawbones) onto a museum truck.

even by common, local species. For instance, as of 1985, the stomach contents of fewer than half a dozen pilot whales (*Globicephala macrorhynchus*), a common toothed whale in the northeast Pacific, had been examined. Even if the food has been partially or fully digested, it is often possible to determine what fish species had been consumed by toothed whales. The earbones of fish, called *otoliths*, and the beaks of squid remain intact even after the rest of the prey has been digested. A fish or squid species can be identified by the sizes and shapes of the otoliths and beaks—often even the size and age of the prey animal can be estimated from these remains.

By examining the beached whale's gonads, the reproductive status of the animal can be determined. In male whales the size of the testes indicates whether the animal was sexually mature or not. For females it requires more careful examination of the ovaries to determine if an animal was sexually mature since the ovaries do not increase in size at sexual maturity as dramatically as the testes of males do. When female mammals become sexually mature, the egg or ovum matures periodically within a specialized group of cells called a follicle. The maturing egg then ruptures from the follicle and is moved to the uterus for fertilization. The follicle itself begins to

enlarge and produces the hormones necessary to maintain the uterus in a condition to receive the fertilized egg and will continue this function during fetal development. While it is impossible to see an individual egg or even a very small fetus within the reproductive tract, the enlarged follicle is plainly visible and provides evidence that the animal was sexually mature. Cetaceans are also unique among mammals in that the scars left by old follicles remain visible throughout the life of the female. In most mammals these scars diminish in size with age, and accurate counts cannot be made. The ovaries of cetaceans, however, provide an accurate record of

Among the great whales, only sperm whales are known to strand en masse with any regularity. In June 1979 this pod swam onto Florence Beach, Oregon. Only toothed whales mass strand. The biological explanation for such biological events still eludes scientists. Photograph by Jim Larison/Oregon Sea Grant.

the number of times that female had ovulated. With enough data from individual animals, biologists can begin to answer such questions as how many young a female can produce and whether or not there is a distinct breeding season.

Most species of toothed whales can be aged by cutting a tooth and counting the layers of dentine or cementum that have been deposited much as the age of a tree can be determined by counting its rings. By studying a large series of stranded specimens, biologists can often determine the relative age at which the males and females become sexually mature and the maximum life expectancy of the species.

Careful dissections provide us with other, more varied information. For instance, tissues are collected to determine the levels of pollutants found in the animals. Study of the shape of the skull can help us gain insight into how the animals produce sounds and, further, help us determine the evolutionary relationships among cetaceans. Once the cetacean has been thoroughly dissected, and we have all the tissue samples we need, the skeletons are then cleaned by allowing the larvae of the dermestid beetle to eat off the remaining dried flesh. The prepared bones are catalogued and stored in the museum's research collection for use by researchers in the future. The end products of an examination of a stranded cetacean are pages of recorded data, photographs, preserved tissue samples, and a skull or skeleton, which can be stored indefinitely in the museum.

The circumstances surrounding the death of our blue whale were unusual, but whales and dolphins are often found stranded along the coastline of California. They may come ashore individually or in groups: alive, but injured or sick, or already dead. If the animal is still alive, it is taken to a facility (if size permits) where it is treated and, if it lives, eventually released. The large size of some species makes caring for them nearly impossible. Animals that are already dead are necropsied in an attempt to determine cause of death. Our blue whale was not necropsied because of its immensity, the difficulty involved in trying to dissect it in shallow water, and because we were certain that the whale died from its collision with the *Barber Tampa*. However, the necropsy is impor-

tant because very little is known about whale mortality.

If the animal is small—a dolphin or a porpoise, for example—its carcass is transported to the museum's research facility. However, large whales such as the blue whale present a wide range of logistical problems and must be dissected on the beach. As we have seen, even long-dead, rotting carcasses found on the beach are of value to biologists, particularly as they may represent a rare species, the skeleton of which can be studied in a museum.

The reasons cetaceans strand are multifold. The vast majority of strandings involve a single moribund or already dead animal. These animals have probably died due to disease, injuries, or old age. Cetaceans can be afflicted with numerous parasites and most diseases known to occur in other mammals such as pneumonia. Some strandings are a direct result of a fishing operation; most of these occur when a whale becomes accidentally entangled in a fishing net and drowns. Sadly enough, cetaceans are purposefully killed on occasion by fishermen who believe that these animals are in competition with them for fish.

More mysterious to biologists are mass strandings of cetaceans, sometimes involving up to several hundred toothed whales. Often, when first found, the animals are still alive and even appear to be healthy; sometimes they will even persistently continue to beach themselves in spite of human efforts to herd them safely into deeper water. Many theories have been advanced to explain this phenomenon. One idea is that all members of the group have been stricken with parasites that affect their ability to navigate. It is unlikely, however, that all members of a group would be afflicted with this terminal condition at precisely the same time. A more reasonable explanation hinges on the gregarious nature and complex social hierarchies of most species of toothed whales. When one high-ranking member of a group becomes ill and strands, the rest of the group may remain with this animal until they also strand and eventually die—this may explain why apparently healthy animals will return and beach themselves. Other plausible explanations include the idea that the echolocation signals that toothed whales probably use for navigation become distorted in the shallow waters near shore. Another re-

cent theory suggests that cetaceans may use the earth's magnetic fields to navigate. Along some coastlines there are geographic features that distort these magnetic features and therefore confuse the cetaceans. Regardless of the cause or causes, mass strandings usually result in the deaths of all the animals involved. Once stranded, even healthy whales succumb to overheating and stress. Although mass strandings are not uncommon in some regions, they are rare events in California.

The Natural History Museum of Los Angeles County has been actively involved with the collection of stranded cetaceans since 1960. Due in large part to this effort, the museum has accumulated a research collection of marine mammal specimens that is second in size in the country only to that of the Smithsonian Institution, and our research collection is used by biologists from all over the world. Information gathered from stranded cetaceans collected by the Natural History Museum has contributed to over seventy articles published in scientific journals.

Stranded marine mammals, whether dead or alive, come under the jurisdiction of the Marine Mammal Protection Act (1972) and thus can only be handled by authorized persons. Other marine mammals such as seals and sea lions also strand in our area, but do so in such high numbers that we cannot respond to reports of them. Strandings of live marine mammals should be referred to Marineland at 213/377-1571. However, anyone who finds a dead cetacean on the beach in Los Angeles and Orange counties should contact the Natural History Museum's Stranding Hotline at 213/585-5105, or the Mammalogy Section at 213/744-3369.

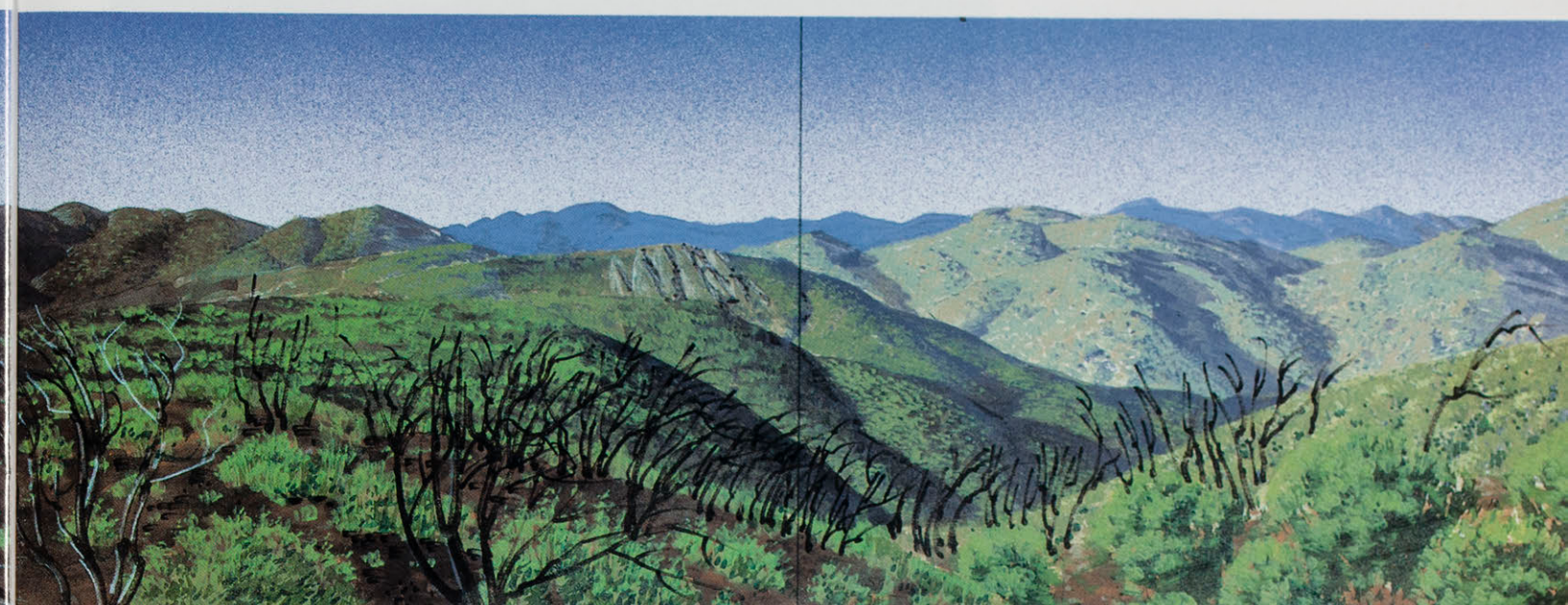
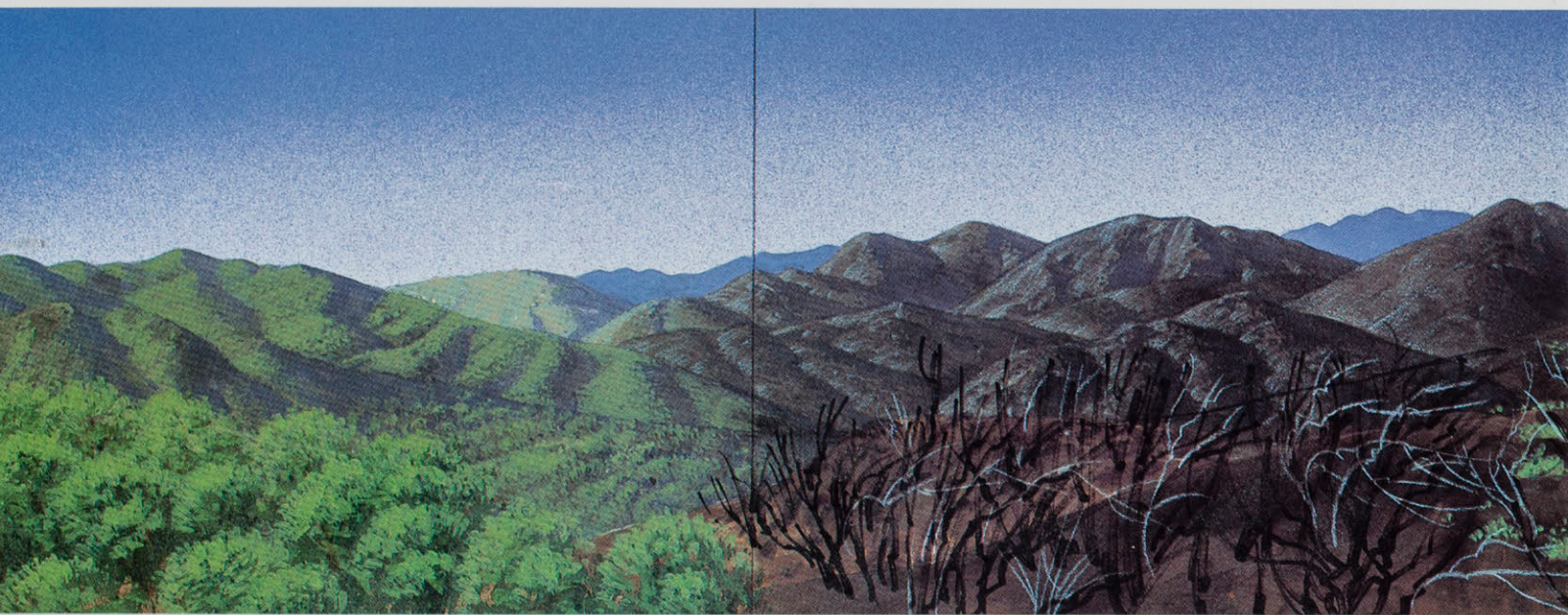
Dr. John E. Heyning is an Assistant Curator of Mammals at the Natural History Museum. A graduate of UCLA, his research interests include the systematics of cetaceans. Dr. Heyning is responsible for coordinating the museum's marine mammal stranding program.

Judith L. Chovan is the Science Education Specialist for the Natural History Museum. A former ranger/naturalist with the National Park Service, Ms. Chovan's interests include insular ecology and evolution. Ms. Chovan has assisted with the stranding program since 1983.



CHAPARRAL

A STORY OF LIFE FROM FIRE

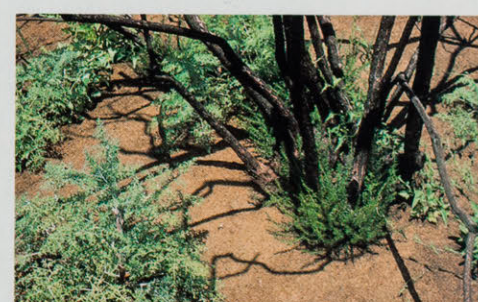


Colorful fire annuals and crown sprouts, typical of recent chaparral growth, appeared in Decker Canyon in the Santa Monica Mountains following a fire in fall 1985. Photograph by Robert Gustafson.

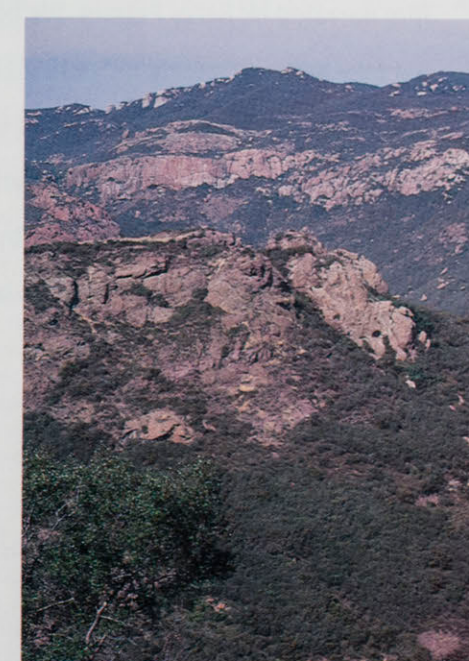
A study for the exhibit's diorama, painted by Museum Artist Robert Reid from an actual site in the Santa Monica Mountains, shows the four stages of the burn cycle upon which the chaparral's ecology depends. From left to right: the mature chaparral, a 15-year-old stand; after a recent burn; crown-sprouting six months after the fire; and two years following the chaparral burn.



Star lilies at Decker Canyon. Photograph by Robert Gustafson.



Crown-sprouting, in which shrubs produce new shoots from burls at the base of their stems, is a special adaptation that some chaparral shrubs have to fire. This chamise (*Adenostoma*) shrub is crown-sprouting following a fire. Photograph by Robert Gustafson.



Mature chaparral. Photograph by Robert Gustafson.

Actress Betsy Palmer narrates the 19-minute film that highlights the unique adaptations of the chaparral community to fire. Photograph by Dick Meier.



The Natural History Museum is pleased to present a permanent exhibit entitled *Chaparral: A Story of Life from Fire*, which explains and illustrates the place of fire in the ecology of the chaparral. Fire, so often viewed in a negative context, is presented here as part of the natural cycle of this unique plant community. A diorama, with a backdrop of the Santa Monica Mountains, shows four stages of this cycle, from a recent burn to mature growth. Integrated with the diorama is a 19-minute film narrated by Betsy Palmer. We hope that after experiencing the new hall, museum goers will visit the Santa Monica Mountains National Recreation Area and view the chaparral with a new understanding of this vital biological resource. The new exhibit, which was made possible by a grant from the Santa Monica Mountains Conservancy, is located on the museum's second floor.

Chaparral is the most characteristic plant community in southern California and, in particular, the Santa Monica Mountains; it is found throughout California, covering some 13 million acres of coast and foothill ranges statewide. The chaparral plant community is associated with a Mediterranean type climate, which also exists around

the Mediterranean and in central Chile, southwest Australia, and South Africa. In these regions, significant rainfall occurs only during the cool winter months, followed by a long, hot dry season.

The dense shrubs that comprise the chaparral are mostly evergreen and characterized by small, tough leaves. The shrubs grow and flower usually in late

winter and spring. By midsummer they are dry, having lost almost half their winter water content. They are highly flammable and burn readily when the Santa Ana winds whip through the Southland.

Fire is critical to the long-term stability of the chaparral ecosystem. Historically, the natural cause of fire was lightning; however, today almost 90 percent of the fires are set by man, intentionally or otherwise. Fire naturally occurs only once or twice a century; if fires are too frequent, as in the Tujunga Canyon area, there is insufficient time for the plants to reestablish themselves.

Fires are the driving and renewing force of the chaparral. Only after a fire do seeds, which have been lying dormant in the soil for up to one hundred years, germinate to produce new shrubs and herbs. In the first spring after a blaze, the landscape is transformed into a spectacular display of color by the fire annuals. In succeeding years the shrubs, which have adapted specially to recurrent fires, recover quickly, and the annual or herb phase declines and eventually disappears until the next fire. Some of the shrubs produce new shoots from burls at the base of their stems, a condition known as crown-sprouting. Others regenerate only from seeds that have accumulated in the soil. Within a few years after the fire, the crown-sprouts and shrub seedlings will have attained their former size. In the chaparral's mature growth phase, the canopy closes over, forming a dense, almost impenetrable tangle of branches. The landscape is once again covered by a unique blanket of shrubs specially adapted to life in a climate where drought and fire are recurrent realities.

Robert Gustafson
Collections Manager, Botany

chologist; Marshall Kass, President of Louart Corporation; Elliot Mininberg, Vice President of Administration and University Advancement, California State University—Northridge; Robert Patterson, Managing Partner, Laventhol and Horwath; and Sheldon Richman, Partner, Deloitte Haskins and Sells.

The Alliance Board's primary responsibilities are in the areas of annual giving and public programs, encompassing the Fellows, the Dinosaur Ball, and both Regional and Interest Councils. This year four new committees have been established: the Special Projects Committee, which will focus on fund raising; the San Fernando Valley Projects Committee, which will work to increase community awareness and involvement in that area; the Public Programs Committee, which will coordinate special exhibits and events; and the Museum Events Host Committee, which will assist the museum's special events staff at gala previews and openings.

Board of Governors President Honored. Ed Harrison, a member of the Natural History Museum's Board of Governors since 1955 and its president since 1967, was honored at the September meeting of the Board of Trustees. On behalf of the Los Angeles County Board of Supervisors, museum Director Craig C. Black presented Harrison with a plaque recognizing his dedicated service and outstanding contributions to the Natural History Museum and the citizens of Los Angeles County.

Owner-manager of Westwood Center, a 21-story office building in Westwood Village, Ed Harrison has been described as a "collector's collector." He collects everything from cigar bands to eyeglasses in addition to "normal" items such as coins and stamps. His first love, however, is ornithology. His specialty is oology, the branch of ornithology dealing with bird eggs. He has assembled one of the world's finest collections of bird books, bird study skins, and nests, and his bird egg collection is the largest and best-curated in the world.

In addition to the time he has devoted to museum activities, he has made several generous donations to the museum's collections. Most recently, in 1984, he presented the museum with a major collection of gems and minerals, including a magnificent epidote from Austria.

In a time when the museum is growing

and changing at a rate unprecedented in its almost 75-year history, we are deeply indebted to Ed Harrison, not only for his generosity, but for providing the needed continuity and historical perspective to the Board of Trustees.

The Moveable Museum Moves to the Valley. Beginning with the 1986–87 school year, the Moveable Museum is being taken to the San Fernando Valley by members of the Volunteer League of the San Fernando Valley. The Moveable Museum, which was named Los Angeles County's outstanding outreach program in 1984, has reached close to 40,000 elementary students at local schools and libraries since its inception in 1982, bringing the museum to many students who might not otherwise have been able to visit the museum and benefit from its educational programs. Museum docents staff the Moveable Museum and make presentations on four educational topics that relate to the public school curriculum: dinosaurs, North American mammals, California history, and early American history.

The expansion of this highly successful program has been limited, however, by the number of trained volunteers available to make these presentations. Last year Maryann Rinsch, a member of the Volunteer League, contacted Joan Grasty, Chief of Education at the museum, concerning the possibility of the league's assisting with the Moveable Museum in the valley.

The Volunteer League of the San Fernando Valley was founded in 1952 by a group of women interested in serving the growing needs of the valley. Each year the league chooses a number of projects to sponsor, some new and some ongoing. Among its current projects are Options, an in-school alcohol and drug abuse program; Centre Clothes Corner, a project that provides new and used clothing for over two thousand children a year; Victim/Witness Assistance, which provides information and emotional support for people at the San Fernando Courthouse; Choral Music, a program providing entertainment at senior citizens' centers; and Kids on the Block, Inc., an in-school puppet show that teaches elementary school students about how to relate to people who have handicaps.

In the spring of 1986 the league voted to add the Moveable Museum program to its roster of projects, and this fall five

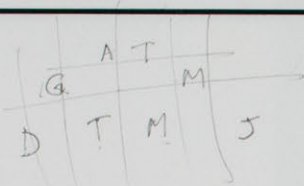
league members received training on the topics of North American mammals and early American history from members of the museum's curatorial staff and Education Division. The fledgling valley program began visiting schools in November and has a busy calendar for the new year. The league plans to recruit additional Moveable Museum members this spring and will offer all four educational topics in the 1987–88 school year. If you are a valley resident and are interested in serving as a volunteer for this rewarding program, please call Joan Grasty at 213/744-3533.

Museum Receives National Support. Over the past three years the Natural History Museum has received a total of \$200,000 in unrestricted grants from the Institute of Museum Service (IMS), an independent agency within the executive branch of the federal government. The IMS was established by act of Congress in 1976 to encourage and assist museums in modernizing their methods and facilities so that they are better able to conserve our cultural, historic, and scientific heritage, and to ease the financial burden borne by museums as a result of their increasing use by the public.

The IMS is the only federal agency to provide general operating support for museums of all disciplines. For many smaller museums, the IMS is the only source of federal support. The policies and programs of the IMS are determined by the National Museum Service Board (NMSB), a presidentially appointed body of fifteen voting members.

Grants are awarded on the basis of the quality of the museum, not on the basis of the need of the applicant. Quality is defined as how well a museum uses its available resources to achieve its basic purposes. Each year, the Natural History Museum's programs are evaluated by independent museum professionals, and compete in the same category as the Smithsonian Institution in Washington, D.C., the American Museum of Natural History in New York, and the Field Museum in Chicago.

Because bringing significant and culturally exciting exhibits to the people of Los Angeles is expensive (major exhibits require a total investment of from \$100,000 to \$250,000 each to present), the funds that the museum has received from the IMS have been used primarily for that purpose. As a result, in 1987 the



museum will present no fewer than nineteen such exhibits.

In a year of federal budget cutting, the IMS program was a prime candidate for extinction. Congress did indeed fund it for 1987, but its future is still not certain. Letters to your elected representatives in Washington can do a great deal to ensure this critical program's continued support not only for the Natural History Museum, but for museums across the country.

Public Relations Department Wins Major Award. The Natural History Museum's public relations campaign for Maya: Treasures of an Ancient Civilization received the 1986 Prism Award from the Public Relations Society of America for outstanding public relations program in the marketing/entertainment category from the Public Relations Society's Los Angeles Chapter.

Assistant Manager of Public Relations, Mary Ann Dunn, and Public Relations Director, John Charnay, accepted the award at the Prisms Awards dinner at the Sheraton Universal Hotel last September. Earlier, Mrs. Dunn had also received the Publicity Club of Los Angeles Pro Award for the Maya campaign. Both competitions had a record number of entries, with over 200 entries submitted in each competition.

Working with a very limited budget for the exhibit, the Public Relations department developed special promotional ties with May Company, Ticketmaster, B. Dalton Booksellers, KCET, USC, and UCLA. Latino community organizations and the Mexican and Guatemalan consulates promoted the show to their publics. Foster and Kleiser donated billboard space, and N. W. Ayer provided a creative team to design ads and billboards and to write radio and television copy. Noted actor and museum member Vincent Price graciously volunteered his services for the public service announcements produced by N. W. Ayer.

As a result of this very successful campaign, more than 10,000 people per week saw the exhibit, and ticket sales exceeded \$175,000. A total of 3,700 new members were the direct result of the effort. The Maya Marketplace, a specialty shop created specifically for the exhibit, grossed over \$230,000—a record for a museum shop. More than 100 publications from San Francisco to San Diego added the museum and its activities to their regular coverage. The Span-

ish International Network did a feature that was broadcast in Mexico and Central America as well as the United States, and the Spanish language media have continued to focus on the museum. The museum received high visibility within the community and beyond as a result of our Maya campaign—visibility that has continued to this date.

The Bird Council Comes of Age. The Bird Council is a unique organization that introduces people who have an interest in birds to the resources of the Natural History Museum, giving council members a new perspective on ornithology. The council helps support and preserve one of the world's largest and finest avian scientific collections, one that is used by researchers, artists, bird watchers, and naturalists from all over the world.

Activities of the Bird Council in the past year have included lectures about Christmas Island and the birds of Los Angeles County; tours to view California condors and bald eagles; a party to introduce Joseph M. Forshaw, the author of *Kingfishers of the World*, to council members, and a visit to a local aviary to see the largest private collection of toucans in the United States.

Plans for 1987 include seminars on bird banding, hummingbirds, and avian medicine. A research trip to Christmas Island in the Central Pacific is planned for July 1987; Bird Council members will have a unique opportunity to visit the largest coral atoll in the world and help the museum's ornithology curator, Dr. Ralph Schreiber, band boobies, tropicbirds, frigatebirds, and terns. Local trips planned include behind-the-scenes tours of the Los Angeles and San Diego zoos and a bird-banding trip in early spring.

The council provides the museum's extensive ornithology program and world-renowned collection with much-needed support. Annual membership dues for the Bird Council are \$100, which includes membership in the museum (current museum members receive \$30 credit toward council membership). For further information, please contact Mary Ann Daves at 213/744-3438.

Gem & Mineral Council Programs and Field Trips. It should come as no surprise that a museum with one of the world's finest gem and mineral exhibits also offers a remarkably active and exciting

public program focusing on gems and minerals. The museum's Gem & Mineral Council offers its members a remarkably rich and varied program of educational lectures, exclusive social events, and stimulating tours, both near and far.

Among the most exciting of the Gem & Mineral Council's recent activities have been mine tours to the Himalaya tourmaline mine in San Diego County and the Benitoite gem mine in San Benito County. Although it is not possible for the general public to visit these mines, the council was able not only to offer access to the mines, but also to provide unique guided tours and to allow council members the opportunity to collect rare and valuable gemstones.

The Gem & Mineral Council is currently sponsoring a monthly lecture series at the museum. Among the topics covered are colored gemstones, jade, gem carving, famous field gems, pearls, and estate jewelry. More information on these lectures can be found in the museum's *Calendar*.

Coming next July is the first of the council's worldwide gem tours, a two-week expedition to one of the world's most prolific gemstone sources, the Brazilian state of Minas Gerais. This area supplies most of the world's aquamarines, topazes, and tourmalines, as well as many other beautiful gems. Participants will get an insider's look at gem mines, have the opportunity to buy gemstones from dealers at the source, and get a real taste for the history and romance of Brazil.

The Gem & Mineral Council is constantly looking for new, enriching experiences for its members. Its success has been marked by a rapidly growing membership, which now exceeds 125. If you have an interest in gems and minerals, or merely want to learn something about them, the Gem & Mineral Council can provide some of the most rewarding and stimulating experiences available through any museum. And by becoming a member you help to ensure that the Natural History Museum will continue to offer one of the foremost gem and mineral programs in the world.

Annual membership dues for the Gem & Mineral Council are \$100, which includes membership in the museum (current museum members receive \$30 credit toward council membership). For further information, please contact Mary Ann Daves at 213/744-3438.

CURATORS & COLLECTIONS

Lizard Wins First-Place Award for Museum Photographer. A portrait of Venezuelan lizard *Ameiva bifrontata* taken by Museum Photographer John De Leon garnered a first-place award in the professional photographers category of the seventeenth annual Union Artist competition. The lizard, affectionately known as "Miss November" because its image graced the month of November in last year's wall calendar issue of *TERRA*, was collected by Herpetology Curator John Wright and is a distant relative of the lizard seen below, also photographed by John De Leon. The Union Artist competition is sponsored by the Los Angeles County Federation of Labor, AFL-CIO, to direct the attention of the community to the union artists of Los Angeles, professional and amateur, and their cultural activities.

Museum Exhibit of Hawaiian Flora Travels to Honolulu. Last summer the Natural History Museum's exhibit Hawaiian Ecosystem: A Living Heritage made its first appearance as a traveling exhibit when it opened at the Bishop Museum in Honolulu. The photographic exhibit, which was curated by Robert Gustafson, the Natural History Museum's Collections Manager for the

Botany Section, is on display in the Bishop's Kahili Room. It is augmented by important examples of Hawaiian plants from the Bishop's Herbarium Pacificum. Attending the opening with Mr. Gustafson were David Minor, scenic photographer for the show, and Dr. William Theobald, Director of the Pacific Tropical Botanical Garden, one of the underwriters for the exhibit.



A rainbow whiptail lizard (*Cnemidophorus lemniscatus*) collected near Cali, Colombia, by Curator of Herpetology John W. Wright. Dr. Wright spent several weeks last year in Colombia, Costa Rica, and El Salvador continuing his studies of the evolutionary genetics of whiptails and some of their close relatives. Photograph by John De Leon.

BOOK REVIEWS

THE GREAT FATHER: THE UNITED STATES GOVERNMENT AND THE AMERICAN INDIANS, abridged edition, by Francis Paul Prucha, University of Nebraska Press, 1986. Paper, 432 pp., \$9.95.

Francis Paul Prucha, of Milwaukee's Marquette University, is one of the most noted scholars of American-Indian relations in this country. This abridgment of his earlier work has eliminated the detailed footnotes and some of the maps and tables that accompanied the previous publication. However, these changes are not necessarily bad since the abridgment has made the book less expensive and more readable for an audience of nonexperts. The result is a solid survey history of Indian policy of the United States from the time of the War of Independence through the late 1970s.

The record on American Indian policy is basically one of abysmal failure. From the assimilation policy of Thomas Jefferson and the removal practices of Andrew Jackson, which ultimately led to the reservation system, to the New Deal-era reforms, which stressed self-determination, Prucha skillfully leads the reader along the Indians' two-hundred-year travail through the white man's world. Prucha dispassionately presents the pros and cons of official policy, and the reader is allowed to arrive at his or her own conclusions regarding American actions.

For anyone strongly interested in understanding American-Indian relations, *The Great Father* must be considered required reading. It is not a story that will make most Americans feel proud, but it is an aspect of our national history that demands the attention of a humane people. Francis Paul Prucha's final thought-provoking chapter, appropriately entitled "America's Unfinished Business," addresses the still unsettled question of Indian self-determination versus federal paternalism. Before the coming of the white man, the buffalo provided the Plains Indians with all that they needed: food, shelter, and clothing. When the white men wiped out the buffalo herds, they offered the government as the "new buffalo." Currently, the pressures for assimilation are great since neither the government nor the American Indians wish to continue this well-established paternal relationship. Whether or not either will meet the challenges of change that the twenty-first century will certainly bring remains to be seen.

M. Guy Bishop
Assistant Curator
Social History

A DYNASTY OF WESTERN OUTLAWS by Paul I. Wellman, University of Nebraska Press, 1986 (reprint). Paper, 354 pp., \$8.95.

Among Americans, few historical topics have captured the popular imagination so thoroughly as that of crime. Countless films, television shows, and books have embedded the genre into the national consciousness. Notorious figures such as Jesse James, Cole Younger, and Pretty Boy Floyd have emerged as tainted yet beloved American folk-culture heroes. The saint-sinner theme did not originate in the United States; for centuries, the venerable Robin Hood motif has instilled in the hero-bandit a touch of romance, moral character, and ethical, if unconventional, behavior. Virtually every prominent American outlaw has received posthumous absolution for his crimes. Having often emerged from deprived circumstances, these personalities are viewed with a certain visceral acceptance by the common man.

Two studies dealing with the American outlaw theme—Paul I. Wellman's *A Dynasty of Western Outlaws* (published originally in 1961 but reissued this year by the University of Nebraska Press) and Jon Tuska's *Billy the Kid: A Handbook*—illustrate the difficulties encountered in treating this topic from an objective historical perspective. Wellman contends that an unbroken connection of personalities linked a series of criminal gangs, from Quantrill's Raiders to Pretty Boy Floyd. In sketching a broad panorama of outlaw activities in Missouri, Kansas, Texas, and the Oklahoma Territory from the Civil War through the mid-1930s, the author maintains that an unsevered legacy was preserved in the personal relationship cultivated between the most nefarious criminals of the age.

In contrast, Tuska's *Billy the Kid: A Handbook* offers a systematic unraveling of the many myths and facts surrounding New Mexico's celebrated Lincoln County War. Unlike Wellman, who presents a sweeping survey, Tuska examines many aspects of a single, yet significant, historical event. While Wellman casts a wide, somewhat dubious net in supporting his thesis, Tuska concentrates on reconstructing a precise chronology of a dramatized and maligned piece of Americana.

Tuska opens with an exacting analysis of Billy the Kid's origins, including family history, name changes, and other details. In this opening section, the author reveals the intense regard for detail exemplified later in the work, when he considers the many confusing legends

surrounding the Lincoln County War. Tuska, undismayed when faced with the many conflicting stories bearing on the life of Billy the Kid, launches into a determined effort to produce the final word on this fascinating segment of western history.

As for research efforts, Tuska's subtitle is derived from the abundant appendices comprising nearly half the book. In compiling an exhaustive bibliography, strengthened by a copious film list, the author fathoms many tales permeating the life and times of Billy the Kid. Moreover, Tuska attributes greater weight to select sources only after thoughtful comparative analysis. Wellman, on the other hand, annotates his references with much of the same editorializing found in the text. He relies too heavily on "personal" sources without the benefit of strong documentary support.

Though brisk and lively, Wellman's broad survey lacks scholarly cohesion. Are we so easily to assume, for example, that a direct connection existed between the raiders of Civil War fame and the machine-gun antics of Pretty Boy Floyd? Considering the amount of time separating Quantrill's Raiders and the Depression-era gangsters, this idea seems a bit strained. Furthermore, what about the role of many other outlaws perpetrating crimes throughout these seven decades?

Wellman succeeds, however, in presenting convincing testimony on the activities of bandits and their adversaries in the rugged, untamed West. In particular, his vivid depiction of lawlessness in the Oklahoma Cherokee Strip and the desperate measures used by the celebrated "Hanging Judge" Ike Parker make delightful, informed reading. However, when turning his attention to twentieth-century crime, Wellman runs aground with the "dynasty" theme. Considering the widespread violence of the Prohibition era and the rise of urban crime, proof of continuing personal outlaw associations would require more prodigious research than that disclosed in Wellman's treatment. Direct connections between guerrilla raids of the Civil War era and the bootlegging, racketeering, and gangland murders of the 1930s simply do not surface in Wellman's study.

Conversely, in his ambitious attempt to demythologize Billy the Kid, Tuska disregards a predisposed thesis while undertaking a deep consideration of the available sources. In fact, "source scrutiny" emerges in Tuska's book as an essential means of creating sound scholarship from half-truths and legend. For example, his careful handling of the Kid's death refutes mythical embellishments

while retaining a dramatic, poignant quality.

A comparison of these works affords commentary on the state of scholarship in the field of Western criminal history. Wellman's study, considered a classic for the past quarter-century, while teeming with a myriad of stories and facts, falls short in presenting solid information to the serious student of history. Tuska, in assuming the more difficult if less glamorous task, penetrates a formidable legend in creating a premier piece of historical analysis. The result, once again, is that quite often, truth may indeed prove just as absorbing and captivating as fiction.

William L. Cumiford
Assistant Curator
Business and Industrial
History

GOOGIE: FIFTIES COFFEE SHOP ARCHITECTURE by Alan Hess, Chronicle Books, 1985. Paper, 144 pp., \$12.95.

The Golden Arches and Bob's Big Boy restaurants may be just places to devour a burger and fries for some. But to Alan Hess, these buildings represent a distinctive architectural style reflecting tastes (pardon the pun) and visions of the 1950s, as much a symbol of that decade as "Elvis Presley or a '57 Chevy." A practicing architect as well as an architectural historian, Hess catalogued the "Googie" style (named by a detractor after a Los Angeles-based chain of coffee shops) as a student at UCLA, photographing his favorite crazy-shaped buildings in Los Angeles. Here he provides us with a history of Googie's evolution and a rationale for classifying it as an architectural species.

Hess traces the genesis of Googie to 1930s California drive-ins and Streamline Moderne, the futuristic style of the Depression era. New materials available after World War II and increasing interest in jets and rockets inspired architects to create this "anti-gravity architecture of the atomic age" as an expression of faith in the continuation of rapid technological innovation. Architects such as Louis Arm  t and Eldon Davis, the most prolific designers of Googie in southern California, were free in their interpretation of the future, combining disjointed elements, features that sometimes would hang in midair, colorful and cursive scripts, slanted and curved structural lines, and inviting glass walls.

The eye-catching flash of Googie was well suited to its function—to attract and sell something to the 1950s car culture. The style was adapted to the needs

of commercial structures—first coffee shops and drive-ins, then motels, car washes, and other roadside businesses—which were dependent on automobile travelers. The building itself had to mimic blaring neon signs to stop and grab autoists on commercial strips, and very quickly "roadside design learned to sell and serve more effectively." It is not surprising that the style reached its apex in Los Angeles, where Ship's, Norm's, Bob's, and other Googie structures abound in the nation's car culture capital.

Hess locates fifties roadside commercial architecture in the context of twentieth-century architecture in the United States, giving us an appreciation for Googie's form and function while feeding the nostalgia of those of us who frequented these burger palaces in the fifties. Just as important, Hess has demonstrated how the Googie style "told us about ourselves by showing us in full scale and three dimensions what we once thought our future would look like."

Googie is profusely illustrated, contains an index and bibliography, and a self-guided tour of Googie landmarks in Los Angeles and Orange counties. After reading this gem, you might consider your next visit to a favorite fifties coffee shop or drive-in as an encounter with architectural history instead of just an outing for a cup of java or a Big Mac.

Tom Sitton
Assistant Curator
Social History & Historic Sites

PHOTOATLAS OF INCLUSIONS IN GEMSTONES by E. J. Gubelin and J. I. Koivula, ABC Verlag, 1986. Cloth, 532 pages, 1400 illustrations in color, \$175.

The *Photoatlas of Inclusions in Gemstones* is undoubtedly one of the most important and useful books about gemstones ever to be published. The authors, Edward J. Gubelin and John I. Koivula, are two of the world's foremost experts on gemstone inclusions, and the book is an enviable reflection of their talents.

Perhaps this book would not have been so important a decade ago, but in today's world of manufacture of increasingly sophisticated synthetic gemstones, it is the minute inclusions that often make the difference in a correct identification. It is not an exaggeration to say that inclusions are the key to the future of gem identification.

The photoatlas is well organized into six sections. Section I, the introduction, is a series of essays on the importance of inclusions, their beauty, and the tech-

niques used by the authors in their microscopy and photomicroscopy. Part 2 deals with the genesis of gemstones and what inclusions may tell us about a stone's early history in a series of important essays by such notable experts as Drs. Edwin Roedder, Henry Meyer, and Tony Stalder. Section 3 treats the minerals that occur as inclusions.

Section 4 is the heart of the book in that it addresses the inclusions that one can expect to find in each of the more important gemstones. Particularly interesting are the beautiful photographs of these characteristic inclusions, which can even indicate the locality from which a particular stone was recovered. Manmade gemstones are covered in the fifth section, which contains 25 pages of photographs of inclusions in synthetic rubies, a testament to the importance of inclusions in this particular synthetic. Section 6 contains a glossary of terms, a geologic time table, and a fairly comprehensive reading list. The concluding statements in this section point out that the book is meant to be a guide to the gemologist "through the enchanting world of gemstones" and is aimed at stimulating and advancing the science of microgemology. I believe that the authors met their goal.

The photoatlas is not only useful but incredibly beautiful. Both Gubelin and Koivula are noted for their skill at microphotography—Koivula has won international awards for his photographic skills. The publisher took advantage of this and chose to include 1400 beautiful color photographs, which make the book impressive even for someone with little or no knowledge of gemstones. But the book's principal use will be as an invaluable research tool for the gemologist. In the preface, Max Weibel states that the atlas of gemstone inclusions "is the crown of over 40 years of Edward Gubelin's intensive research work," and Charles W. Fryer comments that the book "will prove to be the standard general reference for gemstone inclusions for many years to come." I wholeheartedly agree with both of these gentlemen.

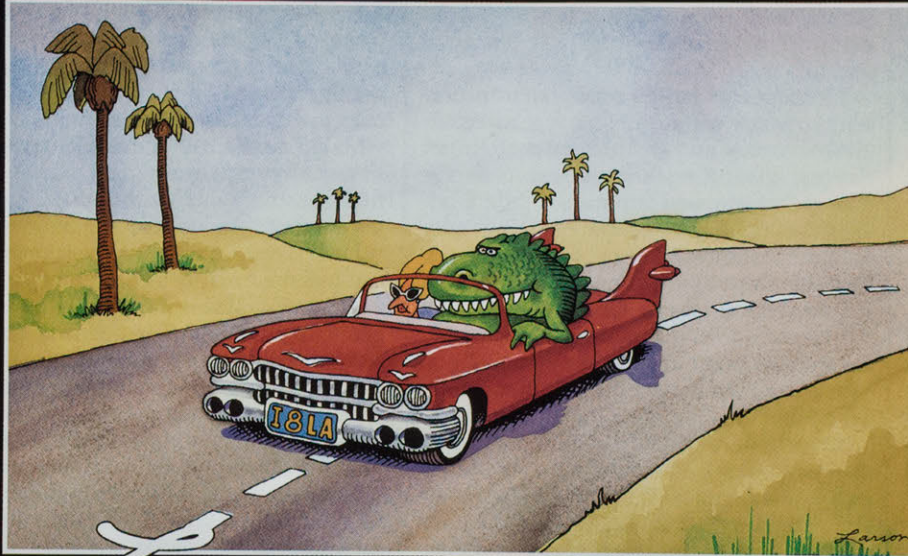
The book's price of \$175 puts it out of reach of many gemstone enthusiasts. It is not a book to be kept on a shelf or displayed on the coffee table, but rather one that will be used daily by those with a serious interest in gemstones. It is a pleasant surprise to find that such an invaluable tool can also be so magnificent to look at and so interesting to read.

Peter C. Keller
Associate Director for
Public Programs



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